METHODS AND COMPOSITIONS FOR CONTROLLED POLYPEPTIDE SYNTHESIS

ABSTRACT OF THE DISCLOSURE

Methods and compositions for the generation of polypeptides having varied material properties are disclosed herein. Methods include means for initiating the polymerization of aminoacid-N-carboxyanhydride (NCA) monomer by combining the monomer with an amido-containing metallacycle, for making self assembling amphiphilic block copolypeptides and related protocols for adding oligo(ethyleneglycol) functionalized aminoacid-N-carboxyanhydrides (NCAs) to polyaminoacid chains. Additional methods include means of adding an end group to the carboxy terminus of a polyaminoacid chain by reacting an alloc-protected amino acid amide with a transition metal-donor ligand complex to forming an amido-amidate metallacycle for use in further polymerization reactions. Novel compositions for use in peptide synthesis and design including five and six membered amido-containing metallacycles and block copolypeptides are also disclosed.